AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 4650C

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COPPER - BERYLLIUM ALLOY BARS AND FORGINGS
Solution Treated

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

2. FORM: Rods, bars, and forgings.

3. APPLICATION: Primarily for parts requiring high strength with good electrical conductivity or lack of magnetic susceptibility.

4. COMPOSITION:

Beryllium	1.90 - 2.15
Nickel or Cobalt	0.20 min
Nickel + Cobalt + Iron	0.60 max
Copper + total named elements	99.50 min

5. CONDITION: (a) Unless otherwise specified, material shall be supplied solution heat treated, and cold-finished if necessary, in a suitable condition for precipitation heat treatment.

(b) Stock ordered for forging shall be supplied as ordered by the forging manufacturer.

(c) The cross-sectional area of rods and bars shall be less than one-half that of the ingots from which they are formed; i.e., rods and bars shall have been subjected to over 50% reduction of area during formation.

6. TECHNICAL REQUIREMENTS: (a) Hardness As Received.-

Nominal Diameter or Thickness Inches	Hardness Brinell (1000 kg load)
1.5 and under	160-223
Over 1.5	200 max

(b) Hardness After Re-solution and Precipitation Heat Treatment.- Material after re-solution heat treatment and precipitation heat treatment at 600 F ± 5 for 3 hours and cooling in air shall have hardness of Rockwell C 33-40.

(c) Physical Properties After Precipitation Heat Treatment.- Material after precipitation heat treatment at 600 F ± 5 for 3 hours and cooling in air shall conform to the following requirements:

Tensile Strength, psi	150,000 min
Yield Strength at 0.2% offset or at 0.0170 inch in 2 in. extension under load, psi	120,000 min
Elongation, % in 4D	3 min
Hardness, Rockwell	C 35 - 42